

ETSI TS 129 523 V17.7.0 (2022-07)



**5G;
5G System;
Policy Control Event Exposure Service;
Stage 3
(3GPP TS 29.523 version 17.7.0 Release 17)**

<https://standards.iteh.ai/catalog/standards/sist/6d8382c1-de35-4f38-86a4-4e570052f822/etsi-ts-129-523-v17-7-0-2022-07>



Reference

RTS/TSGC-0329523vh70

Keywords

5G

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://standards-portal.etsi.org/People/CommitteeSupportStaff.aspx> 4f38-86a4-

If you find a security vulnerability in the present document, please report it through our
Coordinated Vulnerability Disclosure Program:

<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2022.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	5
1 Scope	6
2 References	6
3 Definitions, symbols and abbreviations	7
3.1 Definitions	7
3.2 Abbreviations	7
4 Npcf_EventExposure Service.....	8
4.1 Service Description	8
4.1.1 Overview	8
4.1.2 Service Architecture	8
4.1.3 Network Functions.....	9
4.1.3.1 Policy Control Function (PCF)	9
4.1.3.2 NF Service Consumers.....	9
4.2 Service Operations	10
4.2.1 Introduction.....	10
4.2.2 Npcf_EventExposure_Subscribe service operation	10
4.2.2.1 General	10
4.2.2.2 Creating a new subscription	11
4.2.2.3 Modifying an existing subscription.....	12
4.2.3 Npcf_EventExposure_UnSubscribe service operation	14
4.2.3.1 General	14
4.2.3.2 Unsubscription from event notifications	14
4.2.4 Npcf_EventExposure_Notify service operation	14
4.2.4.1 General.....	14
4.2.4.2 Notification about subscribed events	15
5 Npcf_EventExposure Service API	17
5.1 Introduction	17
5.2 Usage of HTTP.....	17
5.2.1 General.....	17
5.2.2 HTTP standard headers.....	17
5.2.2.1 General	17
5.2.2.2 Content type	17
5.2.3 HTTP custom headers.....	18
5.2.3.1 General	18
5.3 Resources	18
5.3.1 Resource Structure.....	18
5.3.2 Resource: Policy Control Events Subscriptions (Collection)	18
5.3.2.1 Description	18
5.3.2.2 Resource definition	19
5.3.2.3 Resource Standard Methods.....	19
5.3.2.3.1 POST	19
5.3.2.4 Resource Custom Operations	19
5.3.3 Resource: Individual Policy Control Events Subscription (Document).....	19
5.3.3.1 Description	19
5.3.3.2 Resource definition	20
5.3.3.3 Resource Standard Methods.....	20
5.3.3.3.1 GET	20
5.3.3.3.2 PUT	21
5.3.3.3.3 DELETE.....	22
5.3.3.4 Resource Custom Operations	23

5.4	Custom Operations without associated resources.....	23
5.5	Notifications	23
5.5.1	General.....	23
5.5.2	Policy Control Event Notification	23
5.5.2.1	Description	23
5.5.2.2	Target URI	23
5.5.2.3	Standard Methods	24
5.5.2.3.1	POST	24
5.6	Data Model.....	25
5.6.1	General.....	25
5.6.2	Structured data types.....	26
5.6.2.1	Introduction.....	26
5.6.2.2	Type PcEventExposureSubsc.....	27
5.6.2.3	Type PcEventExposureNotif.....	28
5.6.2.4	Type ReportingInformation.....	29
5.6.2.5	Type ServiceIdentification	30
5.6.2.6	Type EthernetFlowInfo	30
5.6.2.7	Type IpFlowInfo	30
5.6.2.8	Type PcEventNotification.....	31
5.6.2.9	Type PduSessionInformation	32
5.6.2.10	Type SnsaiDnnCombination.....	32
5.6.3	Simple data types and enumerations.....	32
5.6.3.1	Introduction.....	32
5.6.3.2	Simple data types	32
5.6.3.3	Enumeration: PcEvent.....	32
5.7	Error handling	33
5.7.1	General.....	33
5.7.2	Protocol Errors.....	33
5.7.3	Application Errors	33
5.8	Feature negotiation.....	33
5.9	Security	34
Annex A (normative): OpenAPI specification.....		35
A.1	General.....	35
A.2	Npcf_EventExposure API.....	35
Annex B (informative): Change history		42
History		45

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ETSI TS 129 523 V17.7.0 \(2022-07\)](https://standards.iteh.ai/catalog/standards/sist/6d8382c1-de35-4f38-86a4-4e570052f822/etsi-ts-129-523-v17-7-0-2022-07)

<https://standards.iteh.ai/catalog/standards/sist/6d8382c1-de35-4f38-86a4-4e570052f822/etsi-ts-129-523-v17-7-0-2022-07>

1 Scope

The present document specifies the stage 3 protocol and data model for the Policy Control Event Exposure Service of the 5G System. It provides stage 3 protocol definitions, message flows and specifies the API for the Npcf Event Exposure service.

The 5G System stage 2 architecture and the procedures are specified in 3GPP TS 23.501 [2], 3GPP TS 23.502 [3] and 3GPP TS 23.503 [4].

The 5G System stage 3 call flows are provided in 3GPP TS 29.513 [8].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition are specified in 3GPP TS 29.500 [5] and 3GPP TS 29.501 [6].

The Policy Control Event Exposure Service is provided by the Policy Control Function (PCF). This service exposes policy control events observed at the PCF.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".
- [3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".
- [4] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".
- [5] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".
- [6] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".
- [7] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.
- [8] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".
- [9] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".
- [10] 3GPP TS 29.507: "5G System; Access and Mobility Policy Control Service; Stage 3".
- [11] 3GPP TS 29.525: "5G System; UE Policy Control Service; Stage 3".
- [12] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".
- [13] 3GPP TS 29.214: "Policy and Charging Control over Rx reference point".
- [14] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".
- [15] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".
- [16] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

- [17] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".
- [18] IETF RFC 7807: "Problem Details for HTTP APIs".
- [19] 3GPP TS 33.501: "Security architecture and procedures for 5G system".
- [20] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".
- [21] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".
- [22] 3GPP TR 21.900: "Technical Specification Group working methods".
- [23] 3GPP TS 29.534: "5G System; Access and Mobility Policy Authorization Service; Stage 3".
- [24] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Data, Application Data and Structured Data for Exposure; Stage 3".
- [25] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

example: text used to clarify abstract rules by applying them literally.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

AF	Application Function
AMF	Access and Mobility Management Function
API	Application Programming Interface
ATSSS	Access Traffic Steering, Switching and Splitting
DNN	Data Network Name
ePDG	evolved Packet Data Gateway
GEO	Geosynchronous Orbit
GPSI	Generic Public Subscription Identifier
HTTP	Hypertext Transfer Protocol
LEO	Low Earth Orbit
MA	Multi-Access
MEO	Medium Earth Orbit
NEF	Network Exposure Function
NID	Network Identifier
NF	Network Function
NRF	Network Repository Function
NWDAF	Network Data Analytics Function
OAM	Operation And Maintenance
PCF	Policy Control Function
RFSP	RAT Frequency Selection Priority
SAC	Service Area Coverage
S-NSSAI	Single Network Slice Selection Assistance Information
SMF	Session Management Function
SNPN	Stand-alone Non-Public Network
SUPI	Subscription Permanent Identifier

UDM	Unified Data Management
UDR	Unified Data Repository
URSP	UE Route Selection Policy

4 Npcf_EventExposure Service

4.1 Service Description

4.1.1 Overview

The Policy Event Exposure Service, as defined in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [4], is provided by the Policy Control Function (PCF).

This service:

- allows NF service consumers to subscribe to, modify and unsubscribe from policy control events; and
- notifies NF service consumers with a corresponding subscription about observed events on the PCF.

The types of observed events include:

- PLMN identifier notification;

NOTE: Within the PLMN identifier notification event the PLMN Identifier or SNPN Identifier where the UE is currently located is provided. The SNPN Identifier consists of the PLMN Identifier and the NID.

- Access type change;
- Satellite backhaul category change;
- Service area coverage change; and
- Successful or unsuccessful outcome of the UE Policy Delivery.

The target of the event reporting may include a group of UE(s) or any UE (i.e. all UEs). When an event occurs, to which the NF service consumer has subscribed, the PCF reports the requested information to the NF service consumer based on the event reporting information definition requested by the NF service consumer (see 3GPP TS 23.502 [3], clause 4.15.1).

4.1.2 Service Architecture

The 5G System Architecture is defined in 3GPP TS 23.501 [2]. The Policy and Charging related 5G architecture and signalling flows are also described in 3GPP TS 29.513 [8].

The Policy Event Exposure Service (Npcf_EventExposure) is part of the Npcf service-based interface exhibited by the Policy Control Function (PCF).

The only known NF service consumer of the Npcf_EventExposure service is the Network Exposure Function (NEF).

The Npcf_EventExposure service is provided by the PCF and consumed by NF service consumers (e.g. NEF), as shown in figure 4.1.2-1 for the SBI representation model and in figure 4.1.2-2 for reference point representation model.

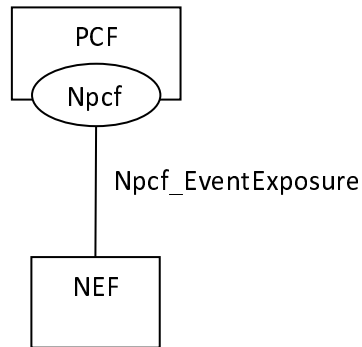


Figure 4.1.2-1: Npcf_EventExposure service Architecture, SBI representation

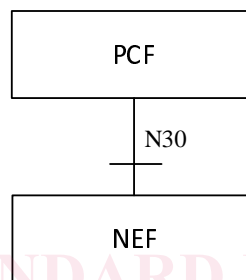


Figure 4.1.2-2: Npcf_EventExposure service Architecture, reference point representation

NOTE: The NWDAF and the DCCF can be consumers of the Npcf_EventExposure service to perform data collection. However, there is no data collected from the PCF by the NWDAF or the DCCF defined in this release of the specification.

4.1.3 Network Functions

4.1.3.1 Policy Control Function (PCF)

The PCF (Policy Control Function) is a functional element that encompasses policy control decision and flow based charging control functionalities as defined in 3GPP TS 29.512 [9], access and mobility policy decisions for the control of the UE Service Area Restrictions and RAT/RFSP control as defined in 3GPP TS 29.507 [10] and UE Policy decisions for the control of Access network discovery and selection policy and UE Route Selection Policy (URSP) as defined in 3GPP TS 29.525 [11].

The policy control decision and flow based charging control functionalities enable the PCF to provide network control regarding the service data flow detection, gating, QoS and flow based charging (except credit management) towards the SMF/UPF. The PCF offers these capabilities to the NF service consumers (e.g. the AF and NEF) as defined in 3GPP TS 29.514 [12] and 3GPP TS 29.214 [13].

The PCF also offers the access and mobility policy control to the NF service consumers as defined in 3GPP TS 29.534 [23].

The Policy Event Exposure Service enables the PCF to report policy control events observed in one or more PCF services to NF service consumers.

4.1.3.2 NF Service Consumers

As indicated in clause 4.1.2 above, the only known NF service consumer of the Npcf_EventExposure service is the Network Exposure Function (NEF).

The Network Exposure Function (NEF) is a functional element that supports the following functionalities:

- The NEF securely exposes network capabilities and events provided by 3GPP NFs to AF.
- The NEF provides a means for the AF to securely provide information to 3GPP network and can authenticate, authorize and assist in throttling the AF.
- The NEF translates the information received from the AF to the one sent to internal 3GPP NFs, and vice versa.
- The NEF supports exposing information (collected from other 3GPP NFs) to the AF.

4.2 Service Operations

4.2.1 Introduction

Service operations defined for the Npcf_EventExposure Service are shown in table 4.2.1-1.

Table 4.2.1-1: Npcf_EventExposure Service Operations

Service Operation Name	Description	Initiated by
Npcf_EventExposure_Subscribe	This service operation is used by an NF service consumer to subscribe for event notifications on a specified policy control event for a group of UE(s) or any UE, or to modify a subscription.	NF service consumer (e.g. NEF)
Npcf_EventExposure_Unsubscribe	This service operation is used by an NF service consumer to unsubscribe from event notifications.	NF service consumer (e.g. NEF)
Npcf_EventExposure_Notify	This service operation is used by the PCF to report UE related policy control event(s) to the NF service consumer which has subscribed to the event report service.	PCF

4.2.2 Npcf_EventExposure_Subscribe service operation

4.2.2.1 General

This service operation is used by an NF service consumer to explicitly subscribe for policy events notifications on a specified context for a group of UE(s) or any UE, or to modify an existing subscription.

The following are the types of events for which a subscription can be made:

- PLMN identifier notification;

NOTE 1: Within the PLMN identifier notification event the PLMN Identifier or SNPN Identifier where the UE is currently located is provided. The SNPN Identifier consists of the PLMN Identifier and the NID.

- change of Access Type;
- when the feature "AMPoliciesEvents" is supported, change of Service Area Coverage;
- when the feature "SatelliteBackhaul" is supported, satellite backhaul category change; and
- when the feature "DeliveryOutcome" is supported, UE Policy delivery outcome.

The following procedures using the Npcf_EventExposure_Subscribe service operation are supported:

- creating a new subscription;
- modifying an existing subscription.

NOTE 2: It is also possible to implicitly subscribe for policy events notifications for a group of UE(s) or any UE. Implicit subscription information is obtained from the UDR for application data. In this case, the PCF will use the callback URI provided by the AF to the UDR, see 3GPP TS 29.519 [24] for the details.

4.2.2.2 Creating a new subscription

Figure 4.2.2.2-1 illustrates the creation of a subscription.

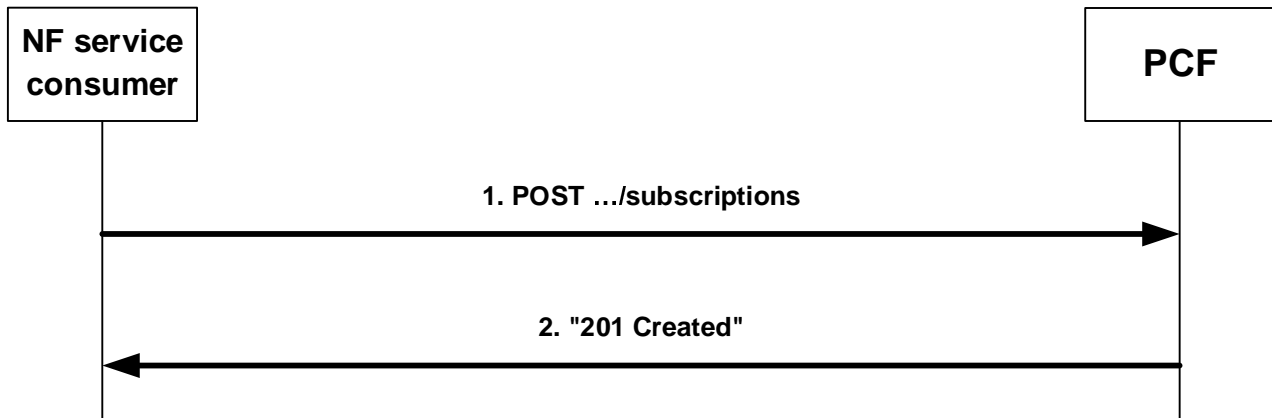


Figure 4.2.2.2-1: Creation of a subscription

To subscribe to event notifications, the NF service consumer shall send an HTTP POST request with: "{apiRoot}/npcf-eventexposure/v1/subscriptions" as request URI as shown in figure 4.2.2.2-1, step 1, and the "PcEventExposureSubsc" data structure as request body.

The "PcEventExposureSubsc" data structure shall include:

- identification of the policy events to subscribe as "eventSubs" attribute;
- indication of the UEs to which the subscription applies via:
 - a) identification of a group of UE(s) via a "groupId" attribute; or
 - b) identification of any UE by omitting the "groupId" attribute;
- a URI where to receive the requested notifications as "notifUri" attribute; and
- a Notification Correlation Identifier assigned by the NF service consumer for the requested notifications as "notifId" attribute.

The "PcEventExposureSubsc" data structure may also include:

- description of the event reporting information as "eventsRepInfo", which may include:
 - a) event notification method (periodic, one time, on event detection) as "notifMethod" attribute;
 - b) Maximum Number of Reports as "maxReportNbr" attribute;
 - c) Monitoring Duration as "monDur" attribute;
 - d) repetition period for periodic reporting as "repPeriod" attribute;
 - e) immediate reporting indication as "immRep" attribute;
 - f) sampling ratio as "sampRatio" attribute;
 - g) group reporting guard time as "grpRepTime" attribute;
 - h) partitioning criteria for partitioning the UEs before performing sampling as "partitionCriteria" attribute if the EneNA feature is supported; and/or
 - i) a notification flag as "notifFlag" attribute if the EneNA feature is supported;
- if the supported feature "ExtendedSessionInformation" is supported, to filter the AF sessions for which the policy event report shall occur, the identification of the services one or more AF sessions may belong to as "filterServices" attribute, which may include per service identification:

- a) a list of ethernet flows in the "servEthFlows" attribute; or
- b) a list of IP flows in the "servIpFlows" attribute; and/or
- c) an AF application identifier in the "afAppId" attribute;
- to filter the DNNs for which the policy event report shall occur, the identification of the DNNs in the "filterDnns" attribute;
- to filter the S-NSSAIs for which the policy event report shall occur, the identification of the S-NSSAIs in the "filterSnssais" attribute; and
- when the feature "EneNA" is supported, to filter the specific DNN and S-NSSAI combination list for which the policy event report shall occur, the identification of each combination within the "snssaiDnn" attribute.

If the PCF cannot successfully fulfil the received HTTP POST request due to an internal PCF error or an error in the HTTP POST request, the PCF shall send an HTTP error response as specified in clause 5.7.

Upon successful reception of the HTTP POST request with "{apiRoot}/npcf-eventexposure/v1/subscriptions" as request URI and "PcEventExposureSubsc" data structure as request body, the PCF shall create a new "Individual Policy Events Subscription" resource, store the subscription and send a HTTP "201 Created" response as shown in figure 4.2.2.2-1, step 2. The PCF shall include in the "201 Created" response:

- a Location header field; and
- an "PcEventExposureSubsc" data type in the payload body.

The Location header field shall contain the URI of the created individual application session context resource i.e. "{apiRoot}/npcf-eventexposure/v1/subscriptions/{subscriptionId}".

The "PcEventExposureSubsc" data type payload body shall contain the representation of the created "Individual Policy Events Subscription".

When the "monDur" attribute is included in the response, it represents a server selected expiry time that is equal or less than a possible expiry time in the request.

When the "immRep" attribute set to true is included in the subscription and the subscribed policy control events are available:

- if the feature "ERIR" is not supported, the PCF shall immediately notify the NF service consumer with the current available value(s) for the subscribed event(s) using the Npcf_EventExposure_Notify service operation, as described in clause 4.2.4.2.
- if the feature "ERIR" is supported, the PCF shall immediately notify the NF service consumer with the current available value(s) for the subscribed event(s) within the HTTP "201 Created" response as shown in figure 4.2.2.2-1, step 2. The "PcEventExposureSubsc" data type shall include the corresponding event(s) notification within the "eventNotifs" attribute, as described in clause 4.2.4.2.

When the sampling ratio as the "sampRatio" attribute is included in the subscription without a "partitionCriteria" attribute, the PCF shall select a random subset of UEs among the target UEs according to the sampling ratio and only report the event(s) related to the selected subset of UEs. If the "partitionCriteria" attribute is additionally included, then the PCF shall first partition the UEs according to the value of the "partitionCriteria" attribute and then select a random subset of UEs from each partition according to the sampling ratio and only report the event(s) related to the selected subsets of UEs.

When the group reporting guard time as the "grpRepTime" attribute is included in the subscription, the PCF shall accumulate all the event reports for the target UEs until the group reporting guard time expires. Then the PCF shall notify the NF service consumer using the Npcf_EventExposure_Notify service operation, as described in clause 4.2.4.2.

When the "notifFlag" attribute is included and set to "DEACTIVATE" in the request, the PCF shall mute the event notification and store the available events.

4.2.2.3 Modifying an existing subscription

Figure 4.2.2.3-1 illustrates the modification of an existing subscription.